



TAOGLAS®



Datasheet

Part No:
GW.05.0153

Description:

Dual-Band Wi-Fi 2.4~2.5GHz/5.15~5.85GHz Terminal Mount Monopole Antenna

Features:

- High Efficiency – with and without ground plane
- Wi-Fi/Bluetooth/Zigbee
- Extremely Compact - 62.3mm ± 1.5mm
- Aesthetic look and feel
- Unique can rotate 360 degrees and articulate through 180 degrees
- Max Peak Gain compliant with most Wi-Fi modules
- Connector: RP-SMA(M)
- Dimensions: 62.3*Ø10mm
- RoHS & Reach Compliant

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1. Introduction



The GW.05 dual band Wi-Fi Hinged Rotatable Antenna is a high efficiency monopole antenna. Compared to other much larger antennas on the market, it has superior wide-band high efficiency characteristics. The bright green colour of the antenna adds a unique quality look and feel to any modern Wi-Fi application point, device or router. It also provides differentiation if using Taoglas other similar looking antennas (such as the black color Taoglas TG.09 cellular antenna) on same device. The connector used is Rev SMA(M), the standard mating part for an antenna to most Wi-Fi application points and routers in the market.

The GW.05, as all monopole antennas, works best connected directly to the ground-plane of the device main PCB or to the outside of a metal housing. However, it still has very good performance (>50%) even without connecting to a ground-plane, making it the best all round small Wi-Fi terminal antenna on the market.

In the un-grounded installation condition, it also comes below the max peak gain requirements for most Wi-Fi modules which are usually 2dBi, so it can comply with FCC regulations. The GW.05 is for Wi-Fi, WLAN, Zigbee, Bluetooth, and 802.11a/b/g/n/ac applications.

Many module manufacturers specify peak gain limits for any antennas that are to be connected to that module. Those peak gain limits are based on free-space conditions. In practice, the peak gain of an antenna tested in free-space can degrade by at least 1 or 2dBi when put inside a device. So ideally you should go for a slightly higher peak gain antenna than mentioned on the module specification to compensate for this effect, giving you better performance.

Upon testing of any of our antennas with your device and a selection of appropriate layout, integration technique, or cable, Taoglas can make sure any of our antennas' peak gain will be below the peak gain limits. Taoglas can then issue a specification and/or report for the selected antenna in your device that will clearly show it complying with the peak gain limits, so you can be assured you are meeting regulatory requirements for that module.

For example, a module manufacturer may state that the antenna must have less than 2dBi peak gain, but you don't need to select an embedded antenna that has a peak gain of less than 2dBi in free-space. This will give you a less optimized solution. It is better to go for a slightly higher free-space peak gain of 3dBi or more if available. Once that antenna gets integrated into your device, performance will degrade below this 2dBi peak gain due to the effects of GND plane, surrounding components, and device housing. If you want to be absolutely sure, contact Taoglas and we will test. Choosing a Taoglas antenna with a higher peak gain than what is specified by the module manufacturer and enlisting our help will ensure you are getting the best performance possible without exceeding the peak gain limits.

It is better not to select an embedded antenna with very low free-space peak gain (<2dBi) directly, as this antenna would have worse performance in your device, and lead to compromised performance compared to using a Taoglas antenna.

This antenna's colour and connector can be customized subject to NRE, for further information please contact your regional Taoglas customer support team.



2. Specifications

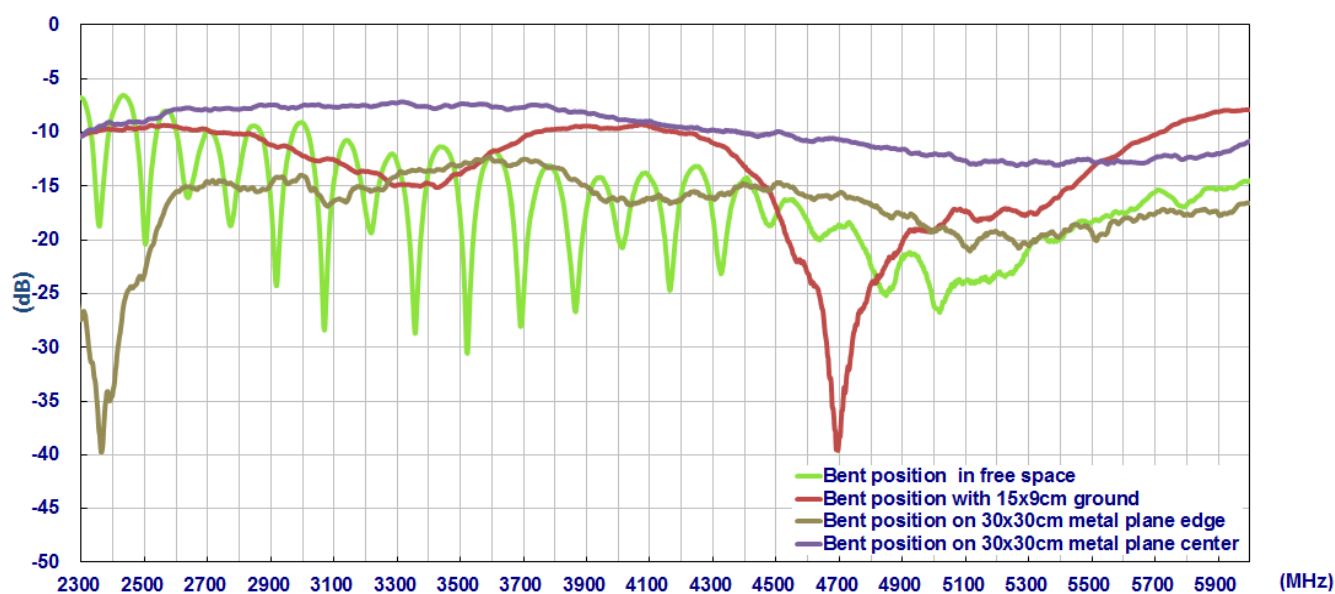
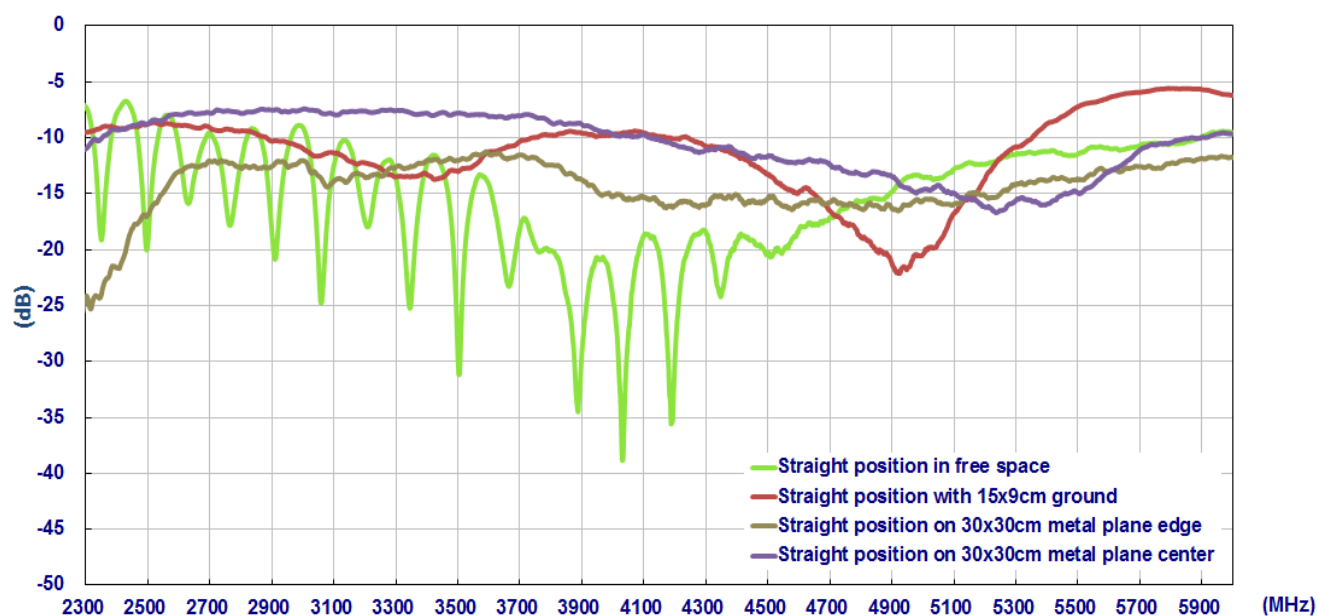
Electrical							
Straight Position							
Frequency	2400	2450	2500	5150	5350	5750	5850
Efficiency (%)							
In Free Space	54.71	54.78	67.05	63.12	60.71	48.43	54.71
With 15x9cm Ground Plane	64.54	69.56	59.14	50.33	49.21	39.26	64.54
On 30x30cm Metal Plane Edge	81.67	86.74	72.99	68.85	63.56	53.23	81.67
On 30x30cm Metal Plane Center	68.05	77.21	58.10	55.32	58.60	48.11	68.05
Average Gain (dB)							
In Free Space	-2.62	-2.61	-1.74	-2.00	-2.17	-3.15	-2.62
With 15x9cm Ground Plane	-1.90	-1.58	-2.28	-2.98	-3.08	-4.06	-1.90
On 30x30cm Metal Plane Edge	-0.88	-0.62	-1.37	-1.62	-1.97	-2.74	-0.88
On 30x30cm Metal Plane Center	-1.67	-1.12	-2.36	-2.57	-2.32	-3.18	-1.67
Peak Gain (dBi)							
In Free Space	1.04	1.25	0.82	0.85	1.38	0.28	1.04
With 15x9cm Ground Plane	3.22	3.57	1.42	1.07	1.30	0.40	3.22
On 30x30cm Metal Plane Edge	4.73	5.13	3.83	3.63	3.93	3.21	4.73
On 30x30cm Metal Plane Center	3.85	4.62	4.50	4.21	5.80	4.67	3.85
Return Loss (dB)							
In Free Space	<-6	<-6	<-6	<-10	<-10	<-10	<-10
With 15x9cm Ground Plane	<-8	<-8	<-8	<-5	<-5	<-5	<-5
On 30x30cm Metal Plane Edge	<-10	<-10	<-10	<-10	<-10	<-10	<-10
On 30x30cm Metal Plane Center	<-6	<-6	<-6	<-10	<-10	<-10	<-10

Bent Position (90°)							
Frequency	2400	2450	2500	5150	5350	5750	5850
Efficiency (%)							
In Free Space	52.53	53.54	68.07	67.43	67.87	65.29	52.53
With 15x9cm Ground Plane	66.14	70.72	63.44	60.53	60.57	57.34	66.14
On 30x30cm Metal Plane Edge	81.40	86.57	70.51	68.75	74.21	73.15	81.40
On 30x30cm Metal Plane Center	70.29	80.04	61.72	59.21	63.83	57.80	70.29
Average Gain (dB)							
In Free Space	-2.80	-2.71	-1.67	-1.71	-1.68	-1.85	-2.80
With 15x9cm Ground Plane	-1.80	-1.50	-1.98	-2.18	-2.18	-2.42	-1.80
On 30x30cm Metal Plane Edge	-0.89	-0.63	-1.52	-1.63	-1.30	-1.36	-0.89
On 30x30cm Metal Plane Center	-1.53	-0.97	-2.10	-2.28	-1.95	-2.38	-1.53
Peak Gain (dBi)							
In Free Space	1.19	1.57	2.57	0.66	1.03	0.59	1.19
With 15x9cm Ground Plane	3.47	3.68	3.88	3.59	2.40	1.92	3.47
On 30x30cm Metal Plane Edge	5.36	5.46	4.98	4.33	4.07	4.53	5.36
On 30x30cm Metal Plane Center	3.63	4.36	3.81	3.31	4.90	4.04	3.63
Return Loss (dB)							
In Free Space	<-6	<-6	<-6	<-10	<-10	<-10	<-10
With 15x9cm Ground Plane	<-8	<-8	<-8	<-7	<-7	<-7	<-7
On 30x30cm Metal Plane Edge	<-10	<-10	<-10	<-10	<-10	<-10	<-10
On 30x30cm Metal Plane Center	<-7	<-7	<-7	<-10	<-10	<-10	<-10
Impedance	50 Ω						
Polarization	Linear						
Radiation Pattern	Omni-directional						
Max. input power	10W						

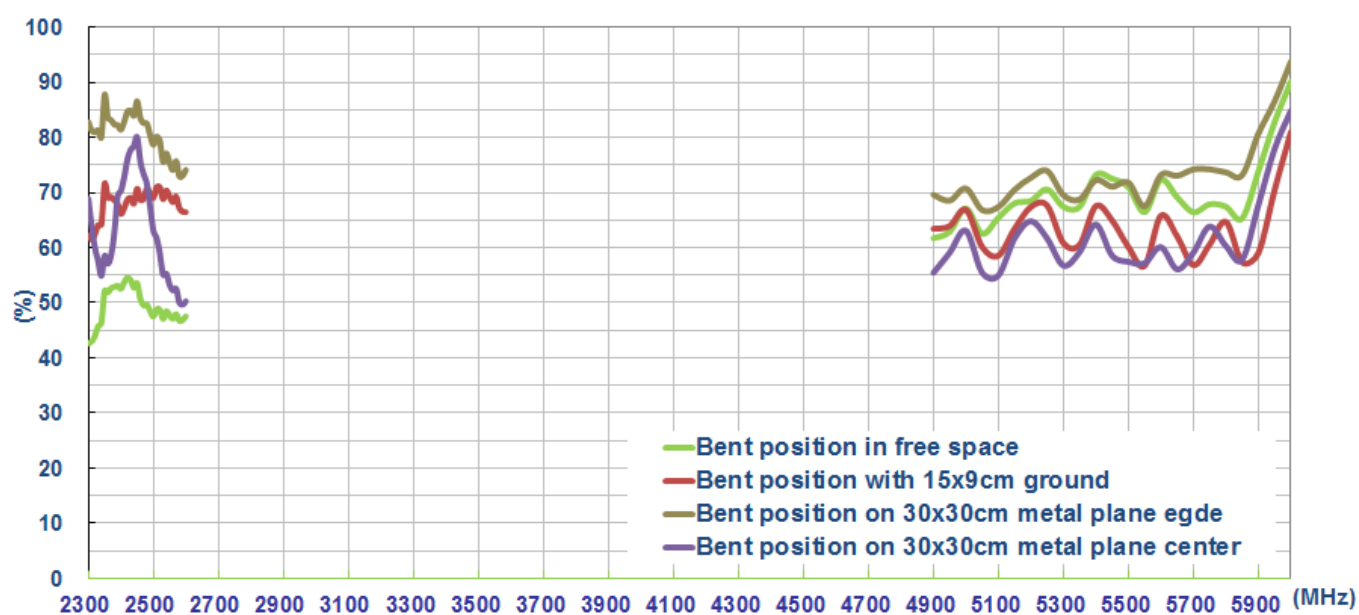
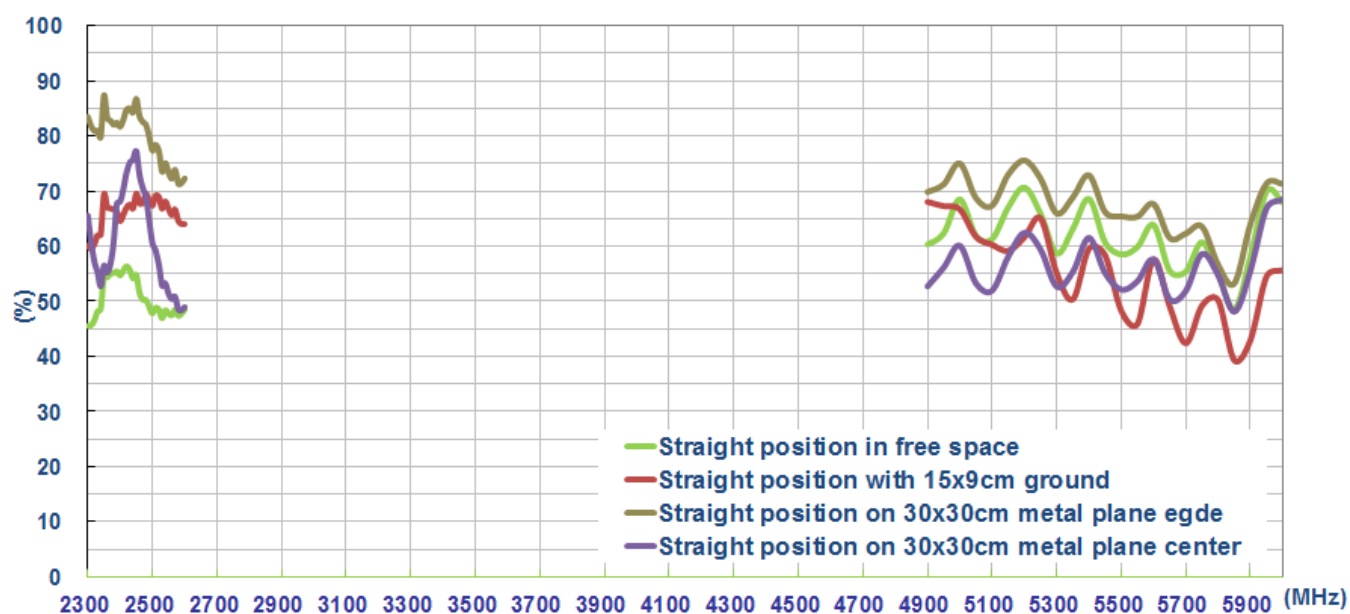
Mechanical	
Antenna length	62.3mm
Antenna Diameter	10mm
Casing	POM
Connector	RP-SMA(M)
Weight	6g
Recommended Torque for Mounting	0.9N·m
Max Torque for Mounting	1.176N·m
Environmental	
Operation Temperature	-40°C ~ + 85°C
Storage Temperature	-40°C ~ + 85°C
Humidity	Non-condensing 65°C 95% RH

3. Antenna Characteristics

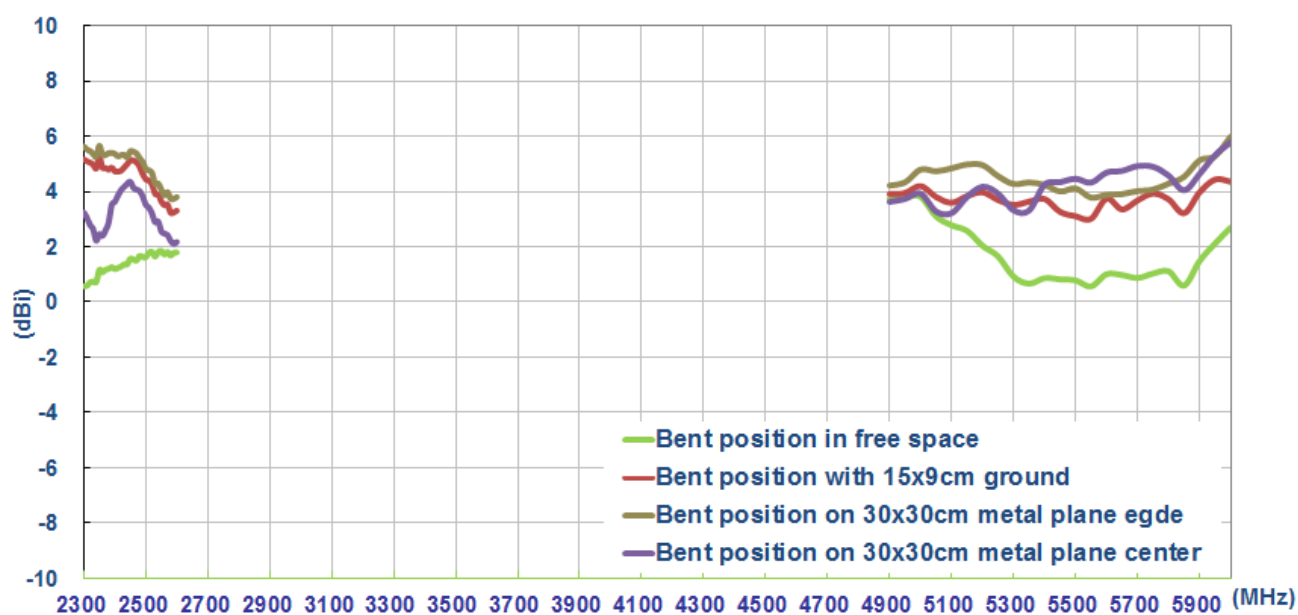
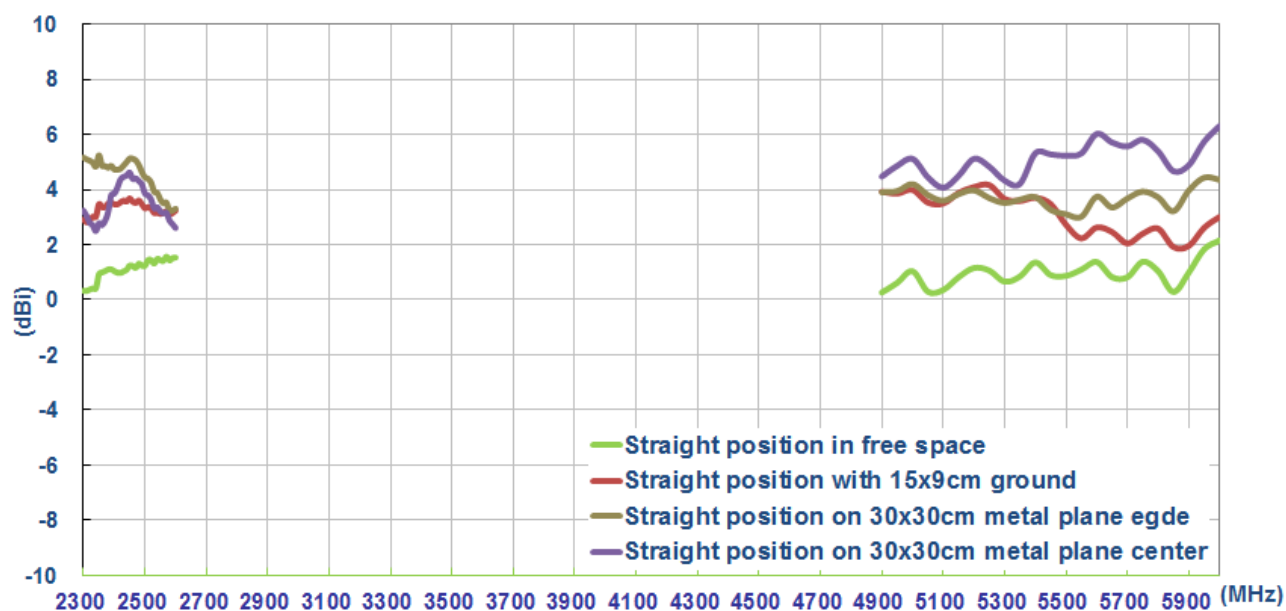
3.1 Return Loss



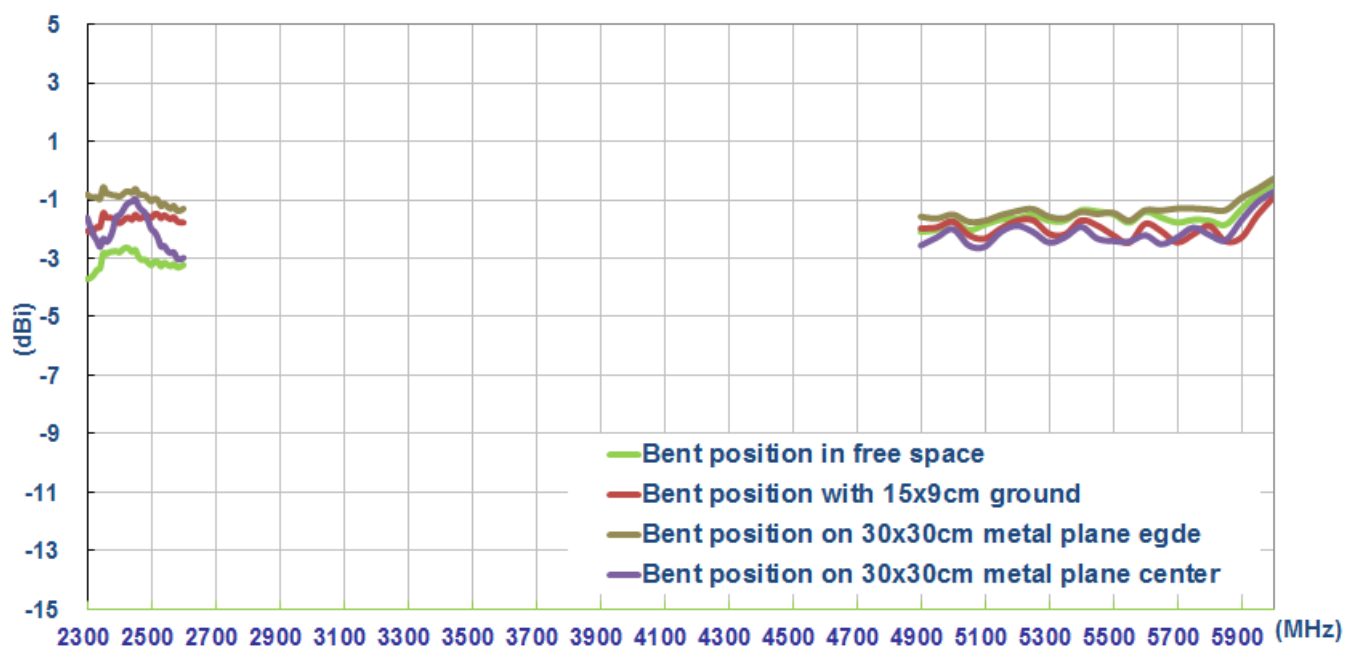
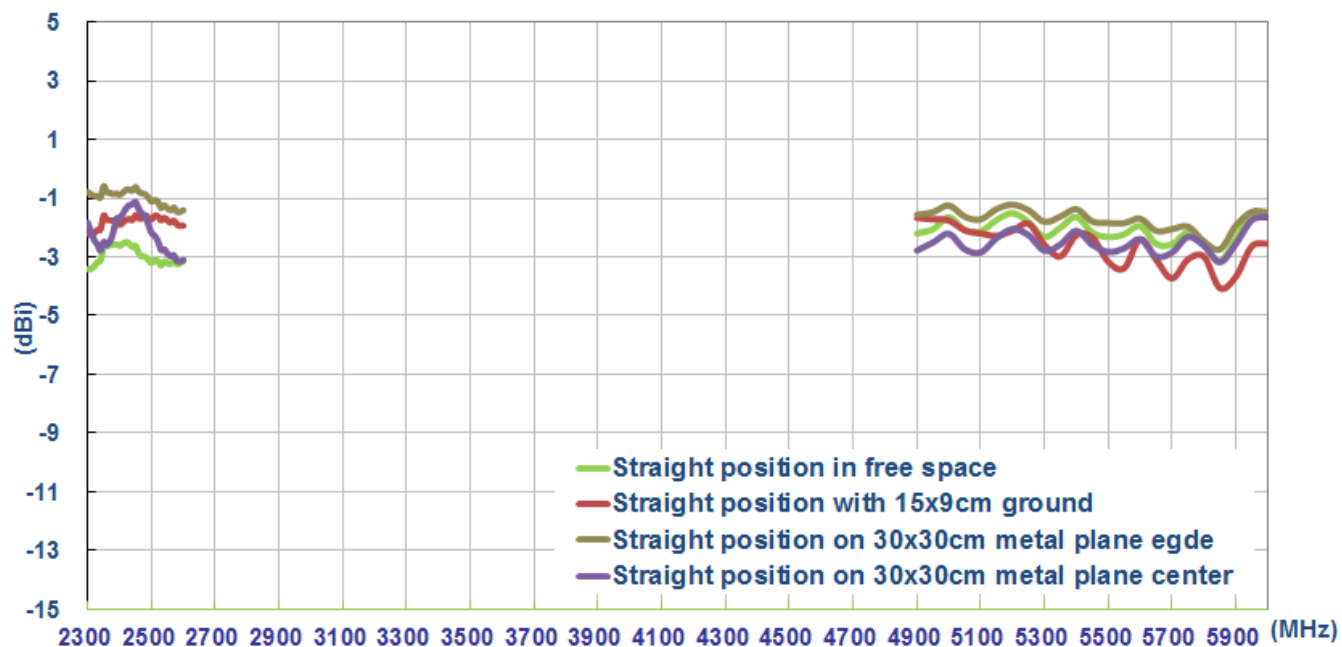
3.2 Efficiency



3.3 Peak Gain

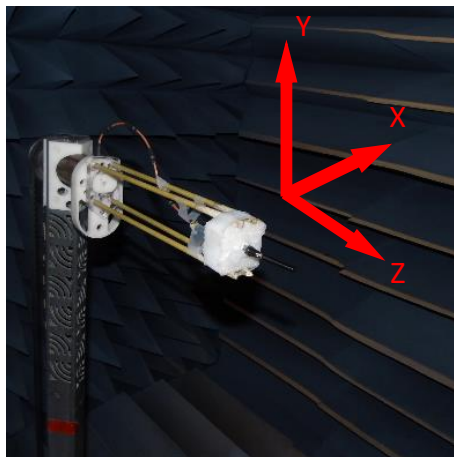


3.4 Average Gain

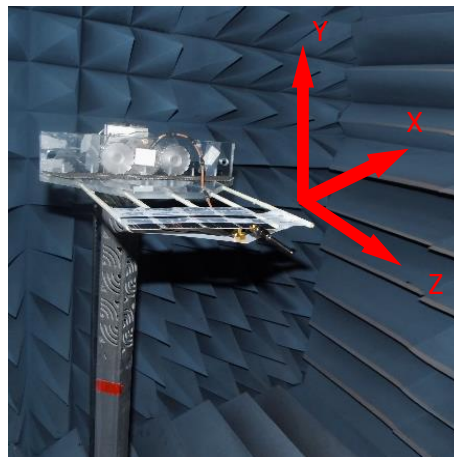


4. Radiation Patterns

4.1 Test Setup – Straight



Free space



15x9cm ground plane



30x30cm metal ground center

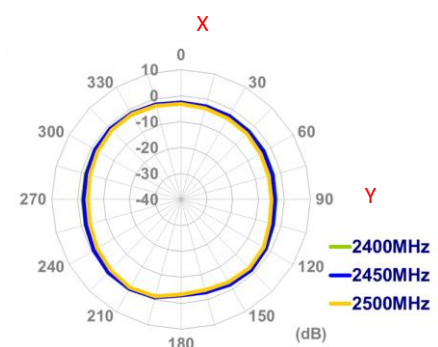


30x30cm metal ground edge

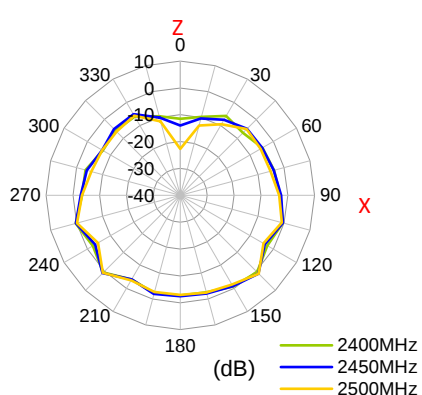
4.2 Straight Free Space - 2D Radiation Patterns

2400-2500MHz

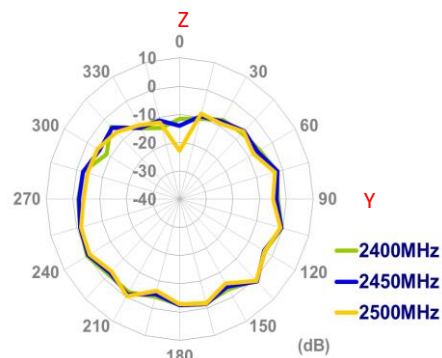
XY Plane



XZ Plane

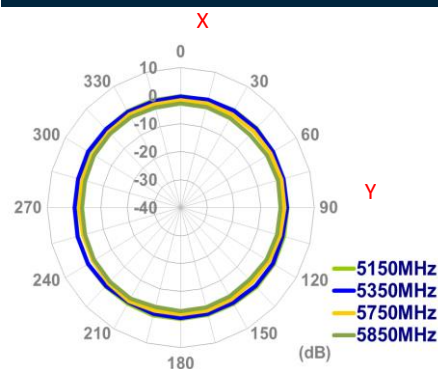


YZ Plane

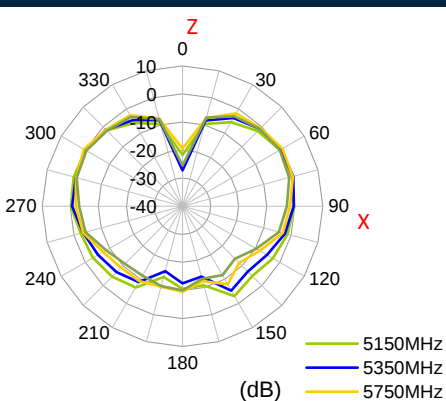


5150-5850MHz

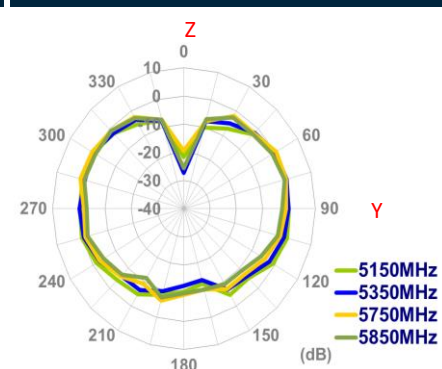
XY Plane



XZ Plane



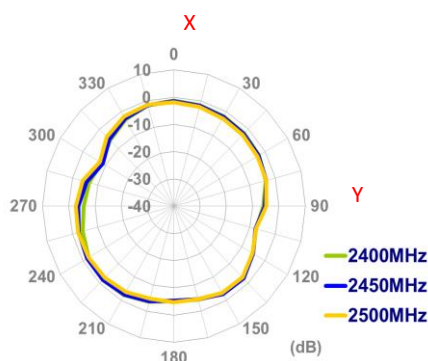
YZ Plane



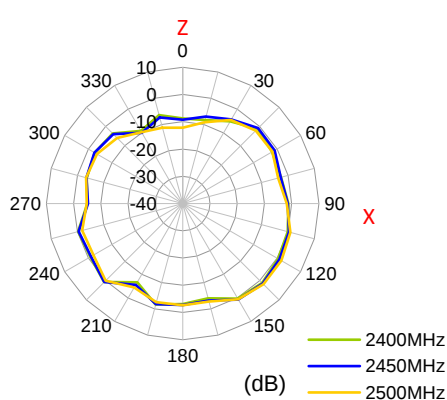
4.3 Straight 15*9cm Ground Plane - 2D Radiation Patterns

2400-2500MHz

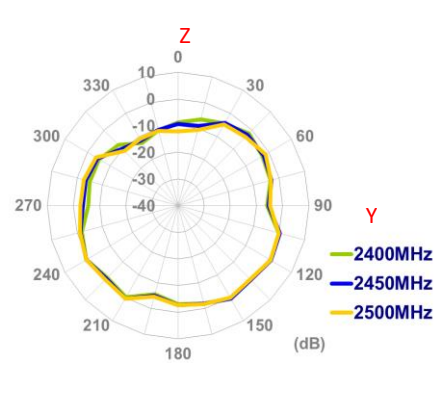
XY Plane



XZ Plane

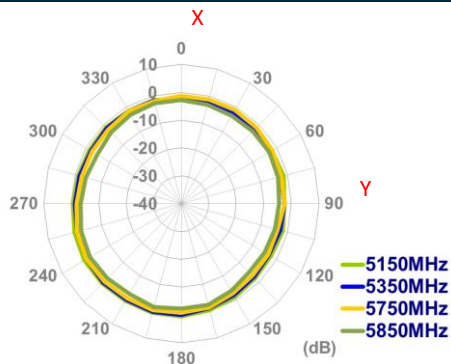


YZ Plane

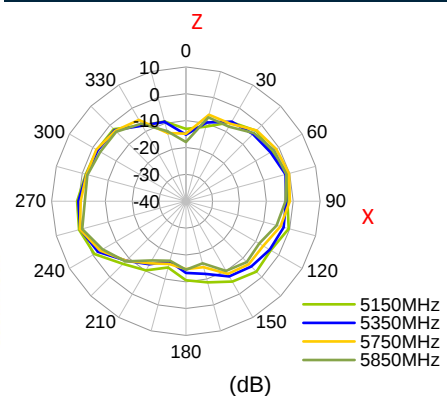


5150-5850MHz

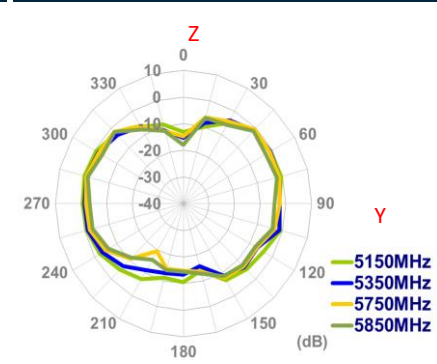
XY Plane



XZ Plane



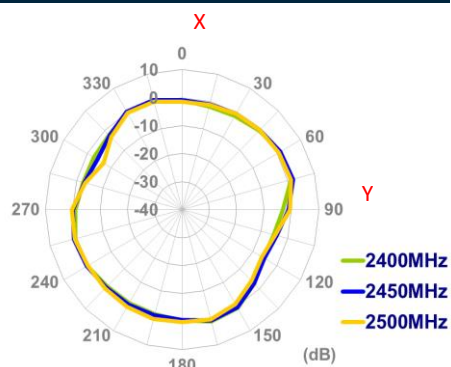
YZ Plane



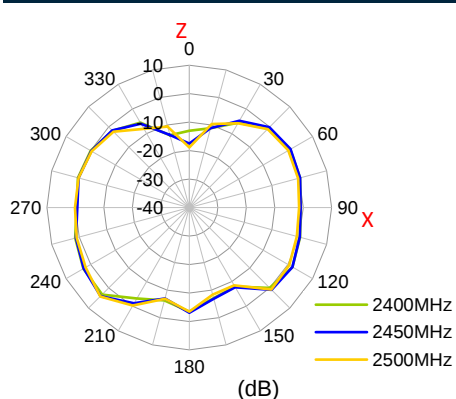
4.4 Straight 30*30cm Ground Plane Edge - 2D Radiation Patterns

2400-2500MHz

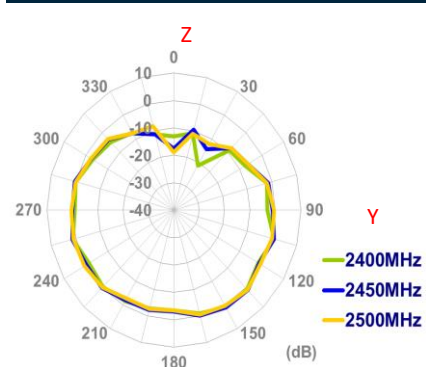
XY Plane



XZ Plane

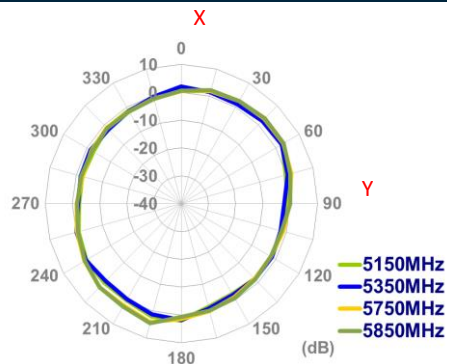


YZ Plane

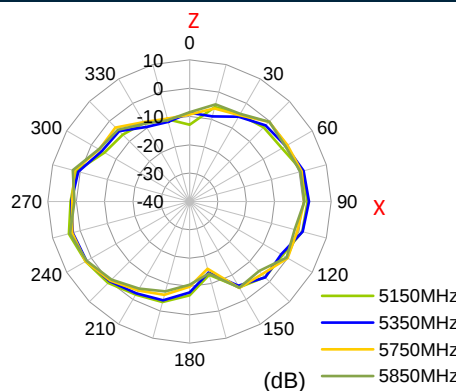


5150-5850MHz

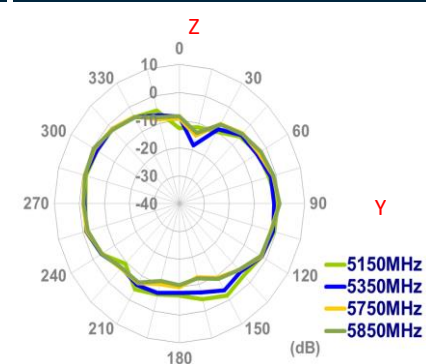
XY Plane



XZ Plane



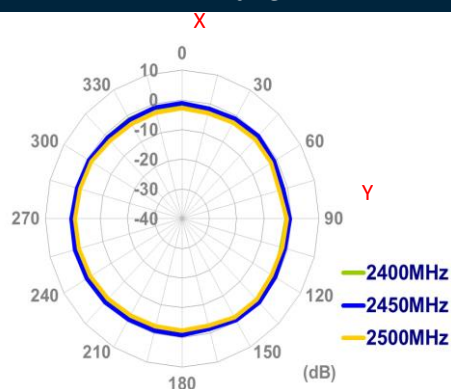
YZ Plane



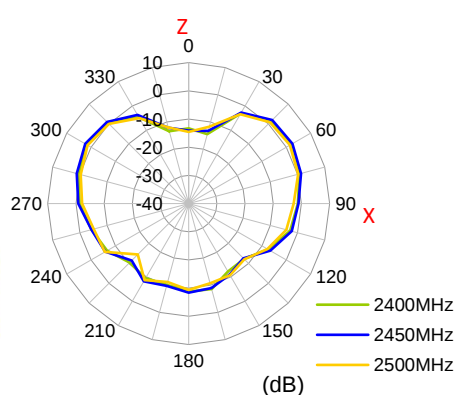
4.5 Straight 30*30cm Ground Plane Center - 2D Radiation Patterns

2400-2500MHz

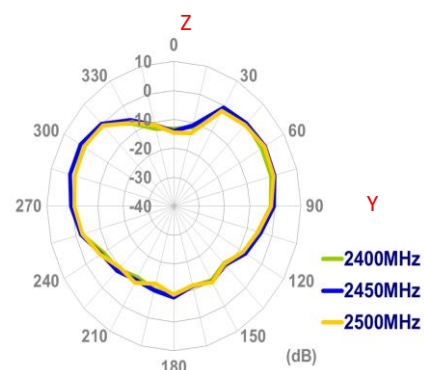
XY Plane



XZ Plane

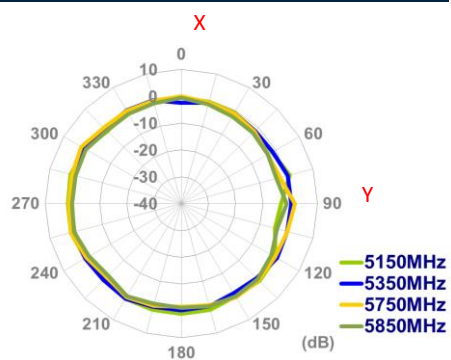


YZ Plane

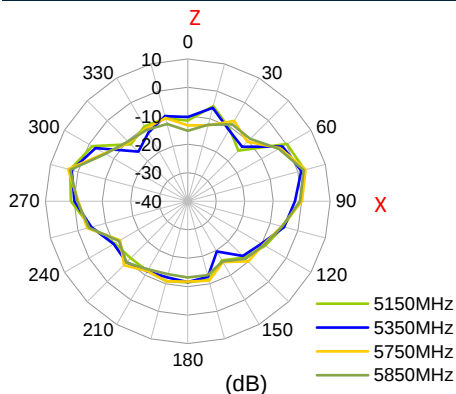


5150-5850MHz

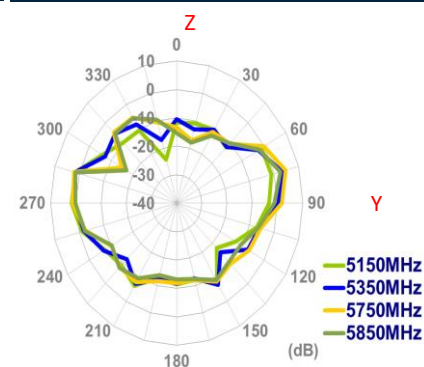
XY Plane



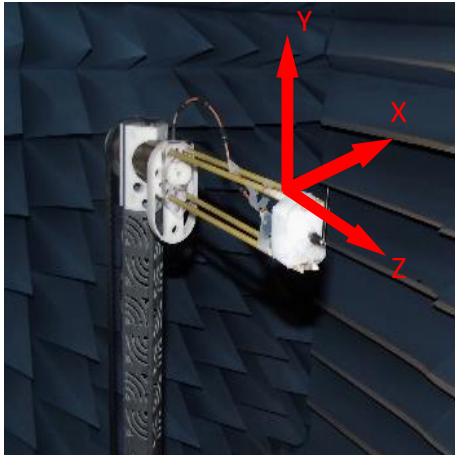
XZ Plane



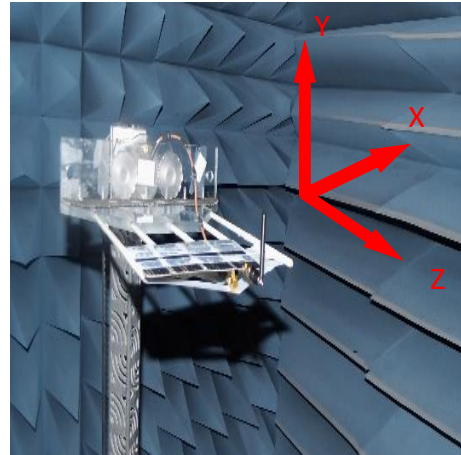
YZ Plane



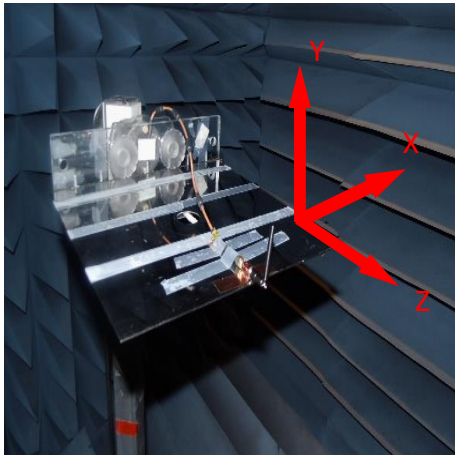
4.6 Test Setup – Bent (90°)



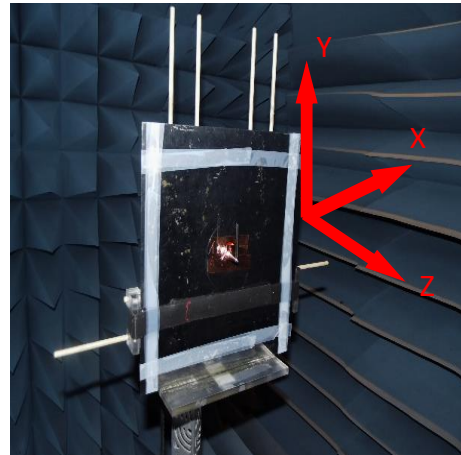
Free space



15x9cm ground plane



30x30cm metal ground center

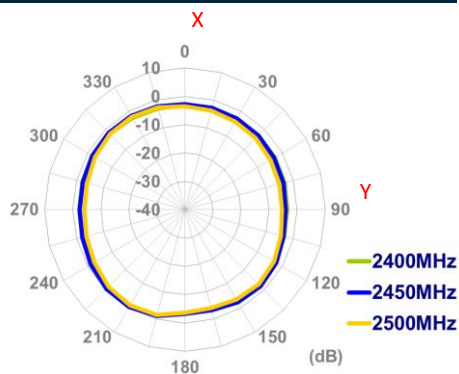


30x30cm metal ground edge

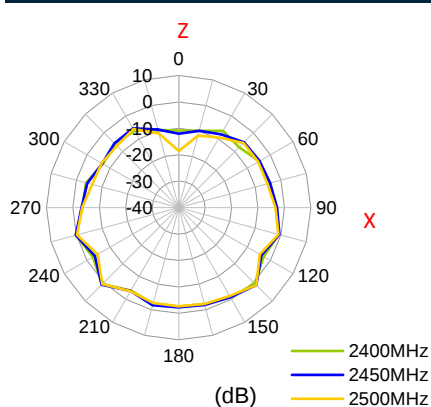
4.7 Bent Free Space - 2D Radiation Patterns

2400-2500MHz

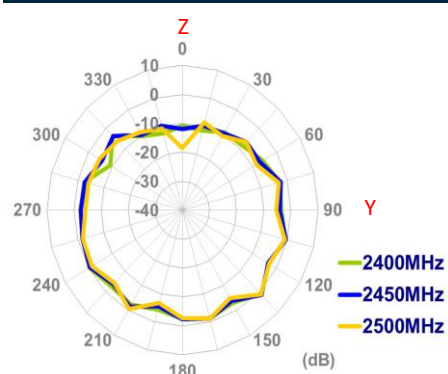
XY Plane



XZ Plane

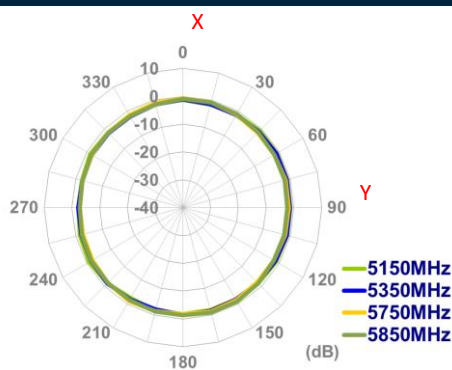


YZ Plane

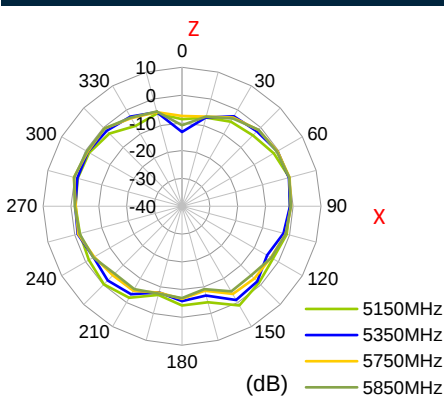


5150-5850MHz

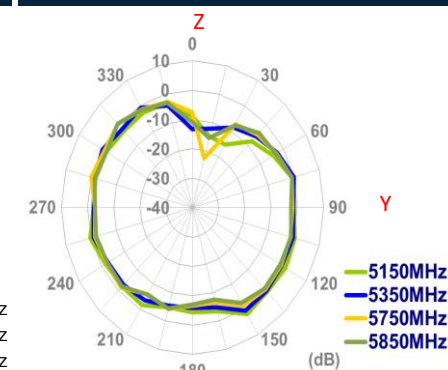
XY Plane



XZ Plane



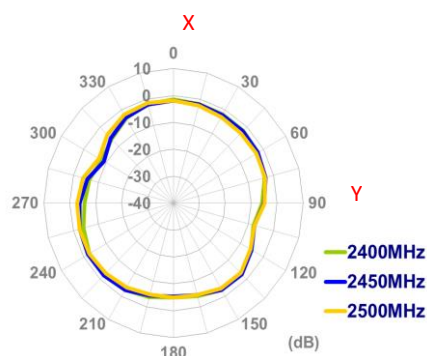
YZ Plane



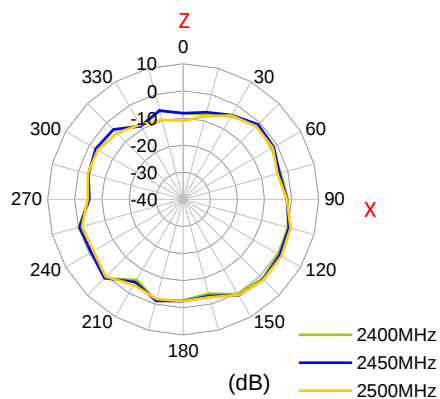
4.8 Bent 15*9cm Ground Plane - 2D Radiation Patterns

2400-2500MHz

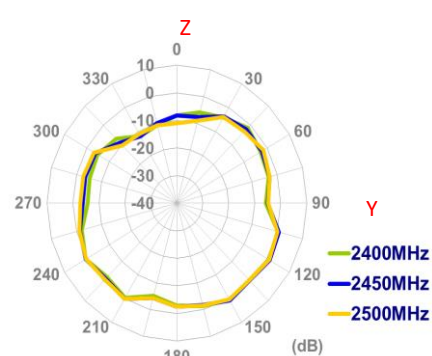
XY Plane



XZ Plane

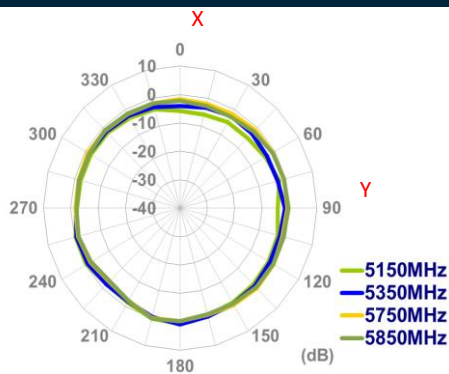


YZ Plane

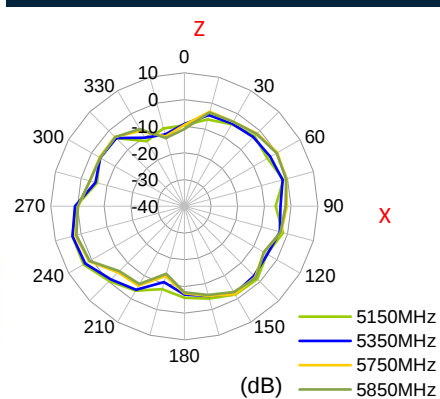


5150-5850MHz

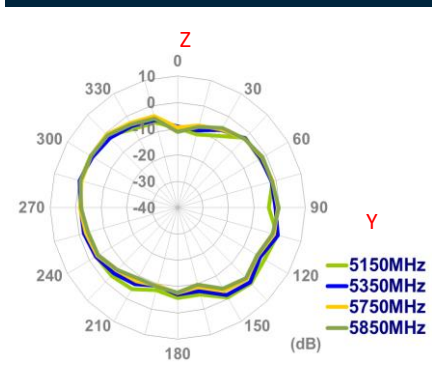
XY Plane



XZ Plane



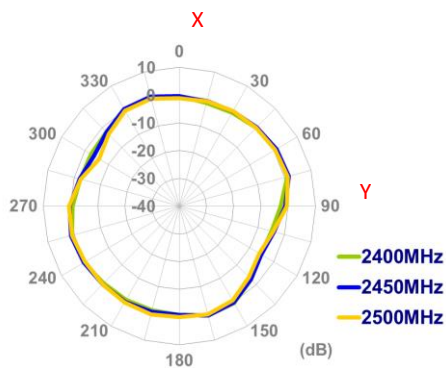
YZ Plane



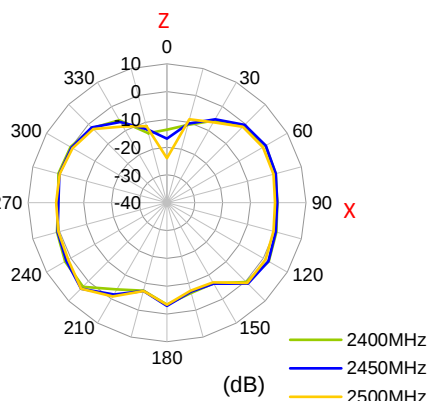
4.9 Bent 30*30cm Ground Plane Edge - 2D Radiation Patterns

2400-2500MHz

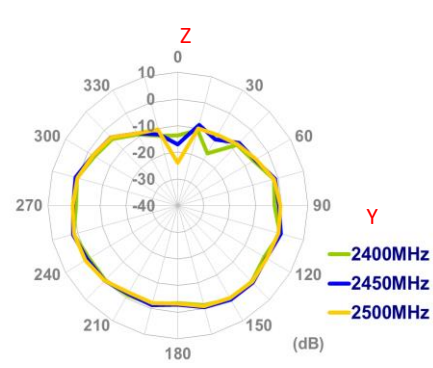
XY Plane



XZ Plane

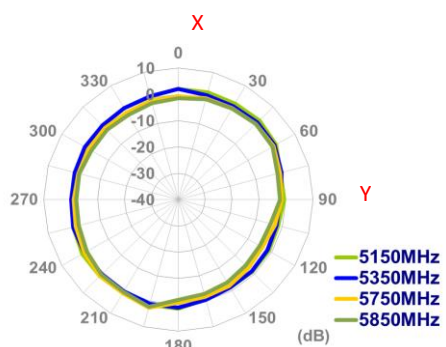


YZ Plane

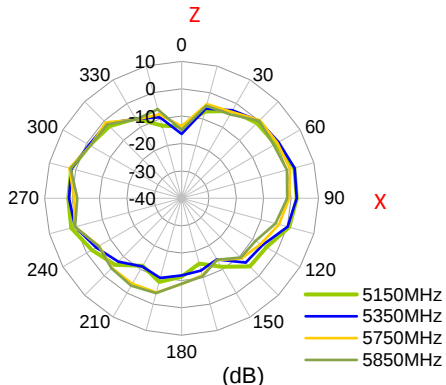


5150-5850MHz

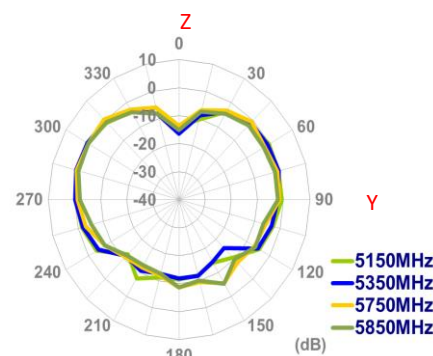
XY Plane



XZ Plane



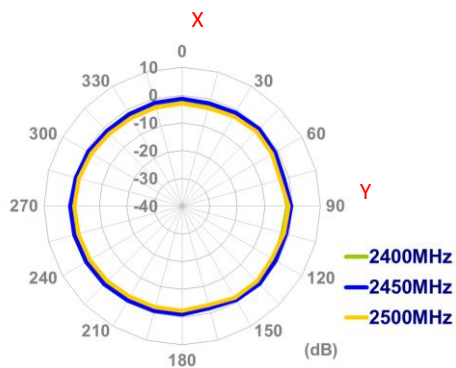
YZ Plane



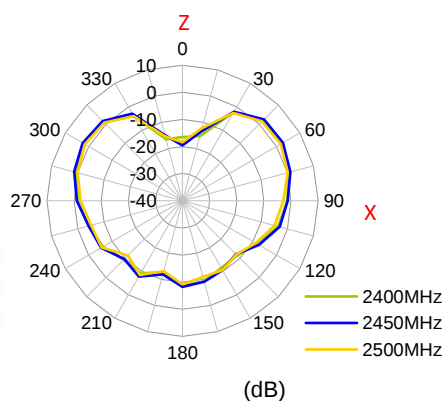
4.10 Bent 30*30cm Ground Plane Center - 2D Radiation Patterns

2400-2500MHz

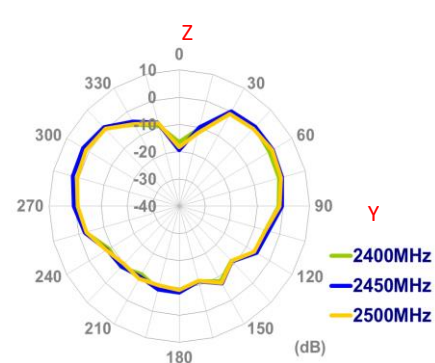
XY Plane



XZ Plane

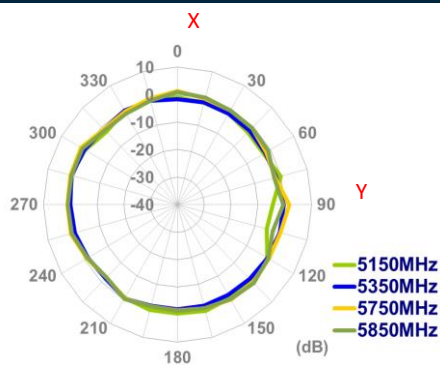


YZ Plane

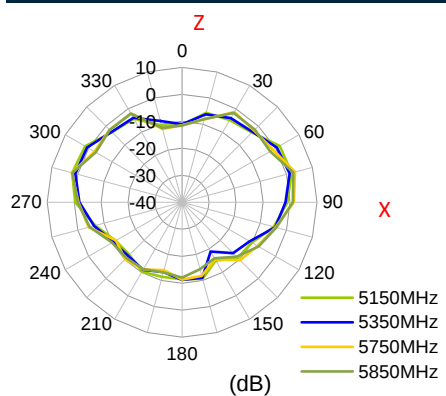


5150-5850MHz

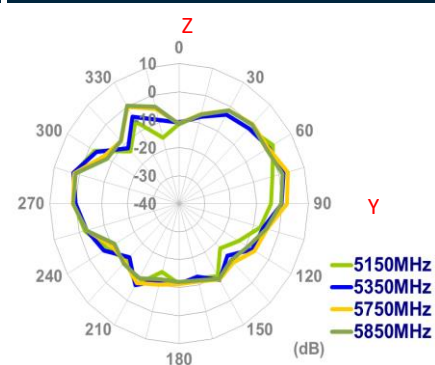
XY Plane



XZ Plane



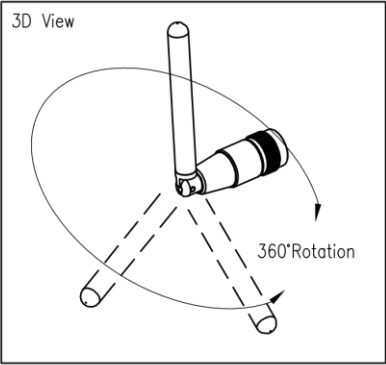
YZ Plane

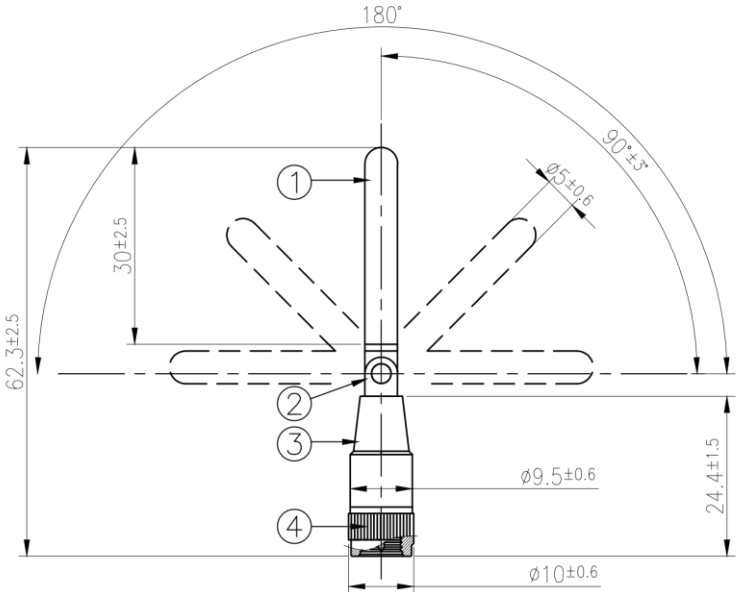


5. Mechanical Drawing (Units: mm)

6	5	4	3	2	1
ISO NO: EDW-18-8-1112	<Release>	REV	ZONE	DESCRIPTION	ENG
		△	ALL	Initial Design	Eva
				APPROVED	ISSUED DATE
				Paul	2018/10/11

3D View





NOTES:

- All Material Must Be RoHS Compliant.
- Housing And Cap Color : Green
ST-14042819I

Name	P/N	Material	Finish	QTY
1 Housing	000113G000002A	POM	Green	1
2 Hinge	000613F000002A	Brass	Ni Plated	1
3 Cap	000713G000002A	POM	Green	1
4 SMA(M) RP	210114C000002A	Brass	Ni Plated	1

UNLESS OTHERWISE SPECIFIED TOLERANCES ON:

.X± 0.2

XX± 0.5 .XX± 0.1

X± 0.3 .XXX± 0.05

APPROVED BY: WAYNE

CHECKED BY: AINE

DRAWN BY: RAISA

DATE: 2014/03/26

UNIT: mm

THIRD ANGLE PROJECTION

SCALE: 1/1

CUSTOMERS SIGNATURE / DATE

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antenna solutions

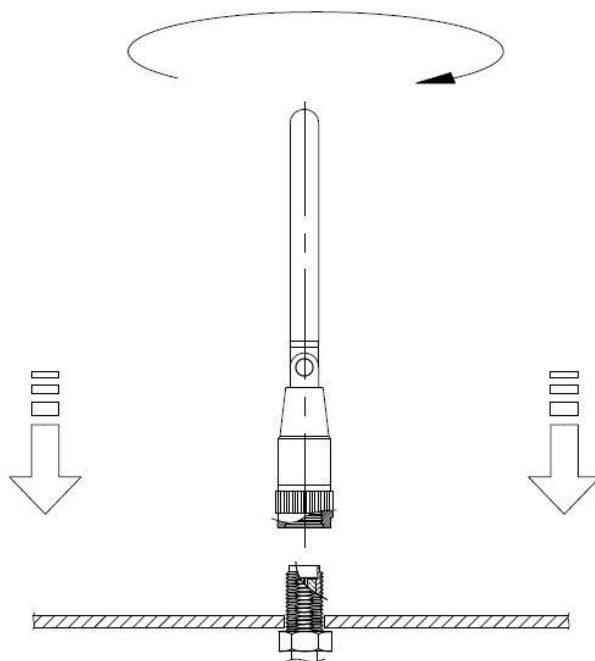
TW Design Centre

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TITLE. : 2.4/5GHz Hinged RP-SMA(M)

PART NO. : GW.05.0153

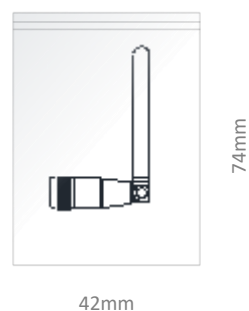
6. Installation



Recommended torque for mounting is 0.9 N·m
Maximum torque for mounting is 1.176 N·m

7. Packaging

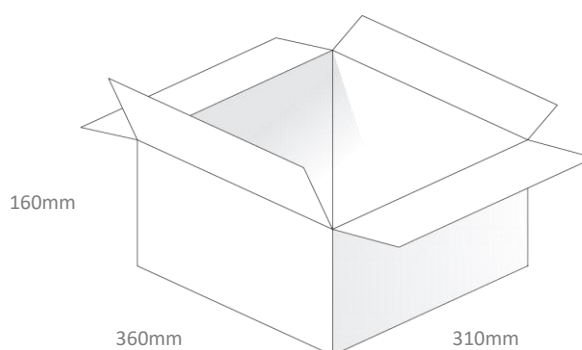
1pc GW.05.0153 per PE Bag
Bag Dimension: 74*42mm
Weight: 8.5g



100pcs GW.05.0153 per Large PE Bag
Bag Dimensions: 180*280mm
Weight: 100g



1500pcs GW.05.0153 per Carton
Dimensions: 360*310*160mm
Weight: 2.5Kg



Changelog for the datasheet

SPE-14-8-105 – GW.05.0153

Revision: D (Current Version)

Date:	2020-05-13
Changes:	Template and formatting updated
Changes Made by:	Jack Conroy

Previous Revisions

Revision: C

Date:	2015-08-24
Changes:	Amended Introduction
Changes Made by:	Aine Doyle

Revision: B

Date:	2015-02-05
Changes:	Added Gain note
Changes Made by:	Aine Doyle

Revision: A (Original First Release)

Date:	2014-09-26
Notes:	
Author:	Technical Writer



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